



US009409189B2

(12) **United States Patent**  
**Ho**

(10) Patent No.: US 9,409,189 B2  
(45) Date of Patent: Aug. 9, 2016

- (54) **MODULAR CYCLONIC SEPARATOR FOR  
SEPARATING SOLID IMPURITIES FROM AN  
AIRFLOW**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 22 days.

(21) Appl. No.: 14/225,709

(22) Filed: Mar. 26, 2014

(65) **Prior Publication Data**

US 2015/0273484 A1 Oct. 1, 2015

(51) Int. Cl.

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|-------------------|-----------|
| <i>B01D 50/00</i> | (2006.01) |
| <i>B04C 9/00</i>  | (2006.01) |
| <i>B01D 45/16</i> | (2006.01) |
| <i>B01D 45/12</i> | (2006.01) |
| <i>B01D 45/08</i> | (2006.01) |
| <i>B04C 3/04</i>  | (2006.01) |
| <i>B04C 3/06</i>  | (2006.01) |
| <i>B04C 7/00</i>  | (2006.01) |
| <i>B04C 11/00</i> | (2006.01) |
| <i>B04C 3/00</i>  | (2006.01) |

(52) U.S. Cl.

- CPC . *B04C 9/00* (2013.01); *B01D 45/08* (2013.01);  
*B01D 45/12* (2013.01); *B01D 45/16* (2013.01);  
*B01D 50/002* (2013.01); *B04C 3/04* (2013.01);  
*B04C 3/06* (2013.01); *B04C 7/00* (2013.01);  
*B04C 11/00* (2013.01); *B04C 2003/006*  
(2013.01); *B04C 2009/004* (2013.01)

- (58) **Field of Classification Search**  
CPC ..... B04C 9/00; B04C 5/28; B04C 2009/007;  
B04C 2009/004; B04C 5/13; B04C 5/14;  
B04C 3/06; B01D 45/16; B01D 45/12;  
B01D 50/002; B01D 45/08  
See application file for complete search history.

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(57) **ABSTRACT**

A modular cyclonic separator comprises separating tubes each including an air-guiding impeller that is fixed coaxially in an outer tube body and that is formed with spiral channels for causing an airflow, which flows radially into the separating tube, to follow a cyclonic flow pattern through a separating chamber in the separating tube, thereby separating some of solid impurities from the airflow within the separating chamber. Each separating tube is capable of connecting selectively with one or two three-port valves to form a first or second filtration module, in which the airflow passes through a fluid passage in the one three-port valve or one of the two three-port valves prior to entering the separating tube.

## **8 Claims, 7 Drawing Sheets**

